IN THE CLAIMS:

1. (Currently Amended) A method for canceling noise on a signal received on a communication channel, the method comprising:

receiving ~~the~~ two or more signals over two or more conductor pairs ~~signal~~, wherein each of two or more signals ~~the signal~~ comprises a differential mode noise component, ~~and~~ a differential mode signal component, and a common mode component and each signal is associated with a conductor pair;

for each signal of the two or more signals,

processing each ~~the~~ signal to isolate the ~~a~~ common mode component to thereby create two or more common mode components;

for each conductor pair, filtering the two or more common mode components to create two or more ~~a~~ cancellation signals associated with each conductor pair;

combining each of the two or more cancellation signals with the signal associated with the conductor pair to cancel the differential mode noise component from the signal associated with that conductor pair to thereby isolate the differential mode signal component;

outputting the isolated differential mode signal component.

2. (Currently Amended) The method of Claim 1, wherein filtering comprises performing processing with a digital filter to process the two or more ~~thereby cause the~~ common mode noise components to more closely resemble the differential mode noise component.

3. (Currently Amended) The method of Claim 1, wherein filtering the two or more common mode components comprises, for each conductor pair, filtering a common mode component from each of the conductor pairs to thereby jointly filter all of the common mode components to create a cancellation signal. ~~the channel comprises a twisted pair of conductors.~~

4. (Currently Amended) The method of Claim 1, wherein the method is performed on each ~~the~~ signal received over each pair of conductors ~~channel~~ of a multi-channel communication system.

5. (Currently Amended) The method of Claim 1, wherein processing each ~~the~~ signal to isolate the common mode component comprises isolating the common mode component utilizing one or more transformers.

6. (Currently Amended) A method for processing a received signal in a multi-channel communication system to reduce unwanted noise, the method comprising:

receiving two or more signals over two or more channels, wherein each of the two or more signals comprise a differential mode component and a common mode component and wherein each of the two or more channels comprise one or more conductive paths;

for at least one signal received on at least one channel of the multi-channel communication system:

isolating the differential mode component through a differential mode isolation unit

providing the differential mode component to a junction;

isolating the common mode component through a common mode isolation unit;

providing the isolated common mode component and at least one common mode component from another channel to a filter;

processing the common mode component and the at least one common mode component from another channel with the filter to generate a cancellation signal;

providing the cancellation signal to the junction; and

combining, within the junction, the cancellation signal with the at least one signal received over the at least one channel to thereby remove the noise in the differential mode component from the at least one signal received over the at least one channel.

7. (Currently Amended) The method of Claim 6, wherein the at least one channel comprises a ~~at least one~~ twisted pair of conductors and the common mode component may be correlated to the noise in the differential mode component.

8. (Currently Amended) The method of Claim 6, wherein processing the at least one signal with the common mode isolation unit comprises providing the signal to at least one transformer stage to thereby isolate the common mode noise component.

9. (Currently Amended) The method of Claim 6, wherein processing with the filter comprises processing the common mode component and the at least one common mode component from another channel with a digital filter having coefficients selected to modify the common mode noise component and the at least one common mode component from another channel into a cancellation signal tailored to cancel the noise present on the differential mode component of a particular channel.

10. (Original) The method of Claim 6, wherein processing with the filter comprises processing each common mode component isolated from each signal received over each channel with a filter tailored for each channel.

11. (Currently Amended) A communication system for processing a received signal to isolate and cancel noise from two or more incoming signals comprising:

two or more inputs configured to receive two or more incoming signals;

at least two common mode isolation units configured to isolate the common mode component of the two or more incoming signals, to thereby generate two or more common mode components, wherein a common mode isolation unit comprises at least one transformer configured to isolate a common mode component;

at least one digital filter, wherein each filter is configured to receive the two or more common mode components and process the two or more common mode components to generate a cancellation signal;

at least one junction associated with at least one channel configured to receive the cancellation signal and combine the cancellation signal with at least one of the incoming signals received over the channel with which the junction is associated, wherein combining the cancellation signal with an incoming signal removes unwanted noise from an incoming signal.

12. (Original) The system of Claim 11, wherein the common mode isolation unit comprises:

a first input configured to receive a first signal from a first channel;

a second input configured to receive a second signal from a second channel;

a first transformer configured to receive the first signal, wherein the first transformer has a center tap configured to output a first center tap signal;

a second transformer configured to receive the second signal, wherein the second transformer has a center tap to output a second center tap signal;

an amplifier configured to receive the first center tap signal and the second center tap signal and output the common mode component.

13. (Original) The system of Claim 11, wherein the common mode isolation unit comprises:

a sensing transformer configured to receive the signal and generate one or more electric fields thereby generating a sensing winding signal in a sensing winding of the sensing transformer;

amplifier configured to receive the sensing winding signal or a signal representing the sensing winding signal and output a modified version of the sensing winding signal, wherein the modified version of the sensing winding signal comprise the common mode component.

14. (Original) The system of Claim 11, wherein the common mode isolation unit comprises:

a first transformer, having a center tap connection, configured to receive the first signal;

a sensing transformer configured to receive the first signal and thereby generate one or more electric fields which in turn generates a sensing winding signal in a sensing winding;

an amplifier configured to receive and amplify the sensing winding signal, which represents the common mode noise signal, and output a modified version of the common mode noise signal.

15. (Original) The communication system of Claim 11, further comprising a line isolation unit associated with each channel, wherein a line isolation unit is configured to isolate the communication system from the communication channel.

16. (Original) The communication system of Claim 11, wherein the junction comprises a summing junction.

17. (Currently Amended) A method for canceling unwanted noise from a signal received over a multi-channel communication system comprising:

receiving two or more signals over two or more channels, wherein each signal comprises a differential mode component and a common mode component;

processing at least two ~~one~~ of the two or more signals to isolate a common mode component associated with each ~~at least one~~ of the two or more signals;

filtering the two or more isolated common mode components to create a cancellation signal for each channel; and

combining the cancellation signal for each channel with at least one received signal or at least one differential mode component to reduce noise in the differential mode component.

18. (Original) The method of Claim 17, wherein processing comprises obtaining a center tap signal from a center tap of a transformer configured to receive the at least one signal, wherein the center tap signal comprises the common mode noise component.

19. (Original) The method of Claim 17, wherein processing comprises generating one or more electric fields by passing the at least one signal through at least one winding of a sensing

transformer to thereby generate a sensing winding signal in a sensing winding of the sensing transformer, wherein the sensing winding signal represents the common mode noise signal.

20. (Original) The method of Claim 17, wherein processing comprises obtaining a center tap signal from a center tap of a first transformer and generating one or more electric fields by passing the center tap signal through at least one winding of a sensing transformer to thereby generate a sensing winding signal in a sensing winding of the sensing transformer, wherein the sensing winding signal represents the common mode noise signal.

21. (Currently Amended) The method of Claim 17, further comprising amplifying the two or more isolated common mode noise signals prior to filtering.

22. (Original) The method of Claim 17, wherein the multi-channel communication system operates in a discrete multi-tone modulation environment.

23. (Original) The method of Claim 17, wherein the processing and filtering occurs on a frequency bin by frequency bin basis and the two or more signals are modulated based on a discrete multi-tone modulation scheme.

24. (Currently Amended) A system for canceling unwanted noise from a signal received over a multi-channel communication system comprising:

means for receiving two or more signals over two or more channels, wherein each signal comprises a differential mode component and a common mode component;

means for processing at least two ~~one~~ of the two or more signals to isolate a common mode component associated with the two or more signals;

means for jointly filtering the at least two isolated common mode component to create a cancellation signal; and

means for combining the cancellation signal with at least one received signal or the differential mode component to cancel or reduce noise in the differential mode component and thereby isolate a signal of interest.

25. (Original) The system of Claim 24, wherein the means for processing comprises one or more transformers configured to reject the differential mode component to thereby isolate the common mode component.

26. (Currently Amended) The system of Claim 24, wherein the means for filtering receives a common mode component associated with each signal received over each channel of the multi-channel communication system and jointly processes the common mode component associated with each signal to approximate the noise in the differential mode component.